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Effect of ribonuclease from *Bacillus intermedius* on human blood lymphocytes

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Abstract

By using a rosette formation test the effect of ribonuclease *Bacillus intermedius* (RNase Bi) on T- and B-lymphocytes in human peripheral blood has been studied in vitro. The RNase effect on T-lymphocytes depends on its concentration: low concentrations (10^{-6}–10^{-2} μg ml^{-1}) stimulate E-rosette formation whereas high concentrations (10 μg ml^{-1}) suppress it. The amount of B-lymphocytes decreases under RNase Bi influence in all concentrations tested. RNase Bi like thymus hormones influence immature lymphocytes (0-cells) by inducing the surface expression of E-receptors what leads to rosette formation and, thus, contributes to lymphocyte differentiation. The increase in the amount of active T-cells which represent the mature cell population also confirms the participation of RNase Bi in T-rank lymphocytes differentiation processes. The RNase Bi effect on the human lymphocytes depends on its catalytic activity.

Keywords: Ribonuclease; Human T- and B-lymphocyte; Rosette formation; *Bacillus intermedius*

1. Introduction

It is known that RNase *B. intermedius* (RNase Bi) stimulates a specific immunity, non-specific factors of protection and hemopoiesis in experimental animals [1]. However, in spite of thorough investigations of the enzyme, the idea of it's immunostimulating activity mechanism is not yet clear. One of the approaches in this study is to investigate interaction between the enzyme and isolated cell populations in the immune system. The lymphocytes are one of the effector links in specific immunologic reactions. In this respect the purpose of the present work was to study RNase *B. intermedius* effect on the lymphocyte populations isolated from human peripheral blood.

2. Materials and methods

2.1. Bacterial enzyme preparations

A native RNase Bi (EC 3.1.4.23) as well as enzyme inactivated selectively by the active site histidine (RNase Biin) have been used in this study. Native enzyme was obtained by the previously published method [2] and purified to electrophoretic homogeneity state, RNase Biin, by the method that we have developed [3].

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